REPORT DOCUMENTATION PAGE

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6a. NAME OF PERFORMING ORGANIZATION	6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION
Adaptive Solutions, Inc.	N/A	Office of Naval Research

6c. ADDRESS (City, State, and ZIP Code)	7b. ADDRESS (City, State, and ZIP Code)
1400 NW Compton Drive, Suite 340 Beaverton, OR 97006	Code 251A GBP Ballston Tower One, 800 North Quincy Street Arlington, VA 22217-5660

8a. NAME OF FUNDING/SPONSORING ORGANIZATION	8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
ARPA	N/A	Contract # N00014-93-C-0234

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	PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.
3701 North Fairfax Drive Arlington, VA 22203-1714	N/A	N/A	N/A	N/A

11. TITLE (Include Security Classification)

High Performance Hardware and Software for Pattern Recognition and Image Processing

PERSONAL AUTHOR(S)
Wendell A. Henry

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16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Pattern Recognition
			Image Processing

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Phase 3 Summary:

Software is in final Beta test.

Option 1 Summary:

Done.

DTIC QUALITY INSPECTED 4

At the time of this report, the project has been authorized to spend $1,997,949.00 for the Phase 1, 2, and 3 tasks plus the one optional task. The project has accumulated expenses of $1,959,433.00. Work on phases 1 and 2 and the optional task are completed. Work on Phase 3 is nearly complete with the software now in Beta test.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	Unclassified

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (Include Area Code)	22c. OFFICE SYMBOL
Wendell Henry	(503) 690-1236	

DD FORM 1473, 84 MAR

83 APR edition may be used until exhausted.
All other editions are obsolete.

R & D Status Report

September 30, 1996

ARPA Order No.:

A407

Contractor:

Adaptive Solutions, Inc.

1400 NW Compton Drive, Suite 340

Beaverton, OR 97006

Contract No.:

N00014-93-C-0234

Contract Amount:

$1,997,949.00

Effective Date of Contract:

November 8, 1993

Expiration Date of Contract:

December 7, 1996

Principal Investigator:

Wendell A. Henry

Telephone Number:

(503) 690-1236

Title of Project:

High Performance Hardware and Software for Pattern Recognition and Image Processing

Title of Work:

R&D Status Report

Reporting Period:

June 1, 1996 through August 31, 1996

19961004 114

Disclaimer

The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the Advanced Research Projects Agency of the U. S. Government.

Project Summary:

Phase 1 Objective:

Build PC/AT form-factor plug-in board using which implements the CNAPS architecture.

Phase 2 Objective:

Port CNAPS Software Development Kit to CNAPS PC board and Windows environment.

Phase 3 Objective:

Design and implement a C-callable function library which includes image processing and neural network functions, and executes on the Phase 1 CNAPS/PC board.

Option 1 Objective:

Design of portions of the next-generation CNAPS chip (X2).

Phase 1 summary:

Done.

Phase 2 Summary:

Done

Phase 3 Summary:

Software is in final Beta test.

Option 1 Summary:

Done.

At the time of this report, the project has been authorized to spend $1,997,949.00 for the Phase 1, 2, and 3 tasks plus the one optional task. The project has accumulated expenses of $1,959,433.00. Work on phases 1 and 2 and the optional task are completed. Work on Phase 3 is nearly complete with the software now in Beta test.

The contract stipulates that $1,997,949.00 is required for the completion of all tasks in Phases 1, 2, 3 and the exercised option. No additional funding is required to complete all phases of the project.

Description of Progress:

The previous Project R&D Status Report stated the following as the objectives for this reporting period:

1. *Complete the incorporation of the classification portion into the Library Manual.*

2. *Complete the implementation and testing of the image processing portion of the library.*

3. *Complete the incorporation of the image processing portion into the Library Manual.*

4. *Conduct additional testing of the fully integrated C-callable library to insure its robustness.*

5. *Document X2 schematics.*

6. *Archive X2 database.*

7. *Develop X2 wafer test infrastructure.*

8. *Develop X2 assembly and burn-in infrastructure.*

9. *Develop X2 unit test infrastructure.*

10. *Continue validation of C2 chip design.*

11. *Generate C2 netlist and turn over to ASIC vendor.*

The following sections discuss the specific progress made in this reporting period in the hardware and software areas towards the stated objectives.

Hardware

Board Design:

> No changes to the CNAPS/PC board hardware design took place this reporting period.

Board Testing:

> Production shipments of the CNAPS/PC board continued.

X2 Array Chip Design:

> The design tasks of the X2 chip were completed during this reporting period. Final documentation of the X2 design reviews and the X2 schematics were completed. An archive of the entire X2 design database was created. This completes the contracted efforts related to the design of the X2 chip.

> Initial silicon for the X2 has been received from Adaptive's chip foundry, Sharp Corporation. The X2 chip is currently undergoing validation and test.

X2 Sequencer Chip (C2) Design:

> Initial design of the C2 chip was completed during this reporting period. The design was turned over to Adaptive's ASIC vendor for logic placement, routing, and preliminary timing simulations.

> Final documentation of the C2 Functional Specification was completed. An archive of the C2 design database was created. This completes the contracted efforts related to the design of the C2 Sequencer chip.

<u>Software</u>

Work on the C-callable library continued. Implementation and unit testing of all callable functions defined for the three sections of the library (linear algebra, recognition, and image processing) have been completed. Documentation of the callable functions in each of the three sections of the library has been completed and included in the Library Manual.

The complete library and its documentation have been released for formal Beta testing. The library is currently being used within Adaptive Solutions for ongoing projects and by customers of Adaptive in their own projects.

Bug fixing and enhancement of the library to meet the needs of the Beta users is ongoing.

<u>Issues and/or Concerns</u>

None.

Plans For Next Reporting Period:

During the next three months work will be directed toward the completion and wrapup of this contract. The following are expected to be achieved:

1. Final release of the C-callable Library after completion of its Beta testing.

2. A final report covering all phases of the contract including the exercised option will be generated.

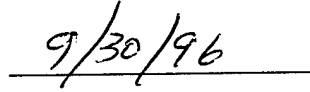3. Shipment of all contracted deliverables.

Fiscal Status:

Amount currently provided on contract:	$1,997,949.00
Expenditures and commitments to date:	1,959,433.00
Funds required to complete work:	$38,516.00

Authorized Phase funding:	$1,997,949.00
Expenditures and commitments to date:	1,959,433.00
Authorized Phase funds remaining:	$38,516.00

At the time of this report, the project has expenditures and commitments totaling 98% of the funds allocated for the contract.

Wendell A. H   _9/30/96_

Wendell A. Henry   Date